

CLAIMS

What is claimed is:

1. 1. A method of scanning the surface of a specimen, using a Scanning Electron Microscope comprising the steps of:
 3. generating a particle beam from a particle beam emitter; and
 4. scanning the surface of the specimen by deflecting the particle beam at an angle with respect to the orientation of the specimen such that the particle beam traverses an angle that is not parallel or perpendicular to the orientation of the specimen.
1. 2. A method as recited in claim 1, further comprising:
 2. collecting the secondary and back scattered electrons generated when the particle beam traversing across the surface of the specimen.
1. 3. A method as recited in claim 1, wherein the specimen being scanned is a semiconductor wafer or a photo mask.
1. 4. A method as recited in claim 1, wherein the particle beam is deflected at an angle relative to the orientation of the specimen in response to the application of an appropriate voltage potential to the particle beam deflecting means.
1. 5. A method as recited in claim 1, wherein the particle beam is deflected at an angle relative to the orientation of the specimen within a range of 1° and 89°.
1. 6. A method as recited in claim 5, wherein the particle beam is deflected at an angle relative to the orientation of the specimen within the range of 15° and 75°.
1. 7. A method as recited in claim 1, wherein the particle beam is deflected at an angle relative to the orientation of the specimen within a range of 91° and 179°.
1. 8. A method as recited in claim 7, wherein the particle beam is deflected at an angle relative to the orientation of the specimen within the range of 105° and 165°.
1. 9. A method as recited in claim 1, wherein the particle beam is deflected at an angle relative to the orientation of the specimen within a range of -179° and -91°.

1 10. A method as recited in claim 9, wherein the particle beam is deflected at an angle relative
2 to the orientation of the specimen within the range of -105° and -165°.

1 11. A method as recited in claim 1, wherein the particle beam is deflected at an angle relative
2 to the orientation of the specimen within a range of -89° and -1°.

1 12. A method as recited in claim 11, wherein the particle beam is deflected at an angle
2 relative to the orientation of the specimen within the range of -15° and -75°.

1 13. An apparatus for scanning the surface of a specimen, using a Scanning Electron
2 Microscope comprising:

3 a particle beam emitter for emitting a particle beam in a SEM; and
4 a deflection unit operative to scan the surface of the specimen by bending the particle
5 beam at an angle relative to the orientation of the specimen, such that the particle beam traverses
6 an angle that is not parallel or perpendicular to the orientation of the specimen.

1 14. An apparatus as recited in claim 13, further comprising:

2 a detector system for collecting the back scattered electrons deflected after traversing
3 across the surface of the specimen.

1 15. An apparatus as recited in claim 13, wherein the specimen being scanned is a
2 semiconductor wafer.

1 16. An apparatus as recited in claim 13, wherein the deflection unit deflects the particle beam
2 at an angle relative to the orientation of the specimen in response to the application of an
3 appropriate voltage potential to the particle beam deflecting means.

1 17. An apparatus as recited in claim 13, wherein the deflection unit deflects the particle beam
2 at an angle relative to the die orientation within a range of 1° and 89°.

1 18. An apparatus as recited in claim 17, wherein the deflection unit deflects the particle beam
2 at an angle relative to the die orientation within the range of 15° and 75°.

1 19. An apparatus as recited in claim 13, wherein the deflection unit deflects the particle beam
2 at an angle relative to the die orientation within a range of 91° and 179°.

1 20. An apparatus as recited in claim 19, wherein the deflection unit deflects the particle beam
2 at an angle relative to the die orientation within the range of 105° and 165°.

1 21. An apparatus as recited in claim 13, wherein the deflection unit deflects the particle beam
2 at an angle relative to the die orientation within a range of -179° and -91°.

1 22. An apparatus as recited in claim 21, wherein the deflection unit deflects the particle beam
2 at an angle relative to the die orientation within the range of -105° and -165°.

1 23. An apparatus as recited in claim 13, wherein the deflection unit deflects the particle beam
2 at an angle relative to the die orientation within a range of -89° and -1°.

1 24. An apparatus as recited in claim 23, wherein the deflection unit deflects the particle beam
2 at an angle relative to the die orientation within the range of -15° and -75°.

1 25. A method of scanning the surface of a semiconductor wafer, using a Scanning Electron
2 Microscope comprising the steps of:
3 generating a particle beam from a particle beam emitter; and
4 scanning the surface of the specimen by deflecting the particle beam at an angle with
5 respect to the orientation of the semiconductor wafer such that the particle beam traverses an
6 angle that is not parallel or perpendicular to the orientation of the semiconductor wafer.

1 26. A method as recited in claim 25, wherein the particle beam is deflected at an angle
2 relative to the orientation of the semiconductor wafer in response to the application of an
3 appropriate voltage potential to the particle beam bending means.

1 27. A method as recited in claim 25, wherein the particle beam is deflected at an angle
2 relative to the die orientation of the semiconductor wafer within a range of 1° and 89°.

1 28. A method as recited in claim 27, wherein the particle beam is deflected at an angle
2 relative to the die orientation of the semiconductor wafer within the range of 15° and 75°.

1 29. A method as recited in claim 25, wherein the particle beam is deflected at an angle
2 relative to the die orientation of the semiconductor wafer within a range of 91° and 179°.

1 30. A method as recited in claim 29, wherein the particle beam is deflected at an angle
2 relative to the die orientation of the semiconductor wafer within the range of 105° and 165°.

1 31. A method as recited in claim 25, wherein the particle beam is deflected at an angle
2 relative to the die orientation of the semiconductor wafer within a range of -179° and -91°.

1 32. A method as recited in claim 31, wherein the particle beam is deflected at an angle
2 relative to the die orientation of the semiconductor wafer within the range of -105° and -165°.

1 33. A method as recited in claim 25, wherein the particle beam is deflected at an angle
2 relative to the die orientation of the semiconductor wafer within a range of -89° and -1°.

1 34. A method as recited in claim 33, wherein the particle beam is deflected at an angle
2 relative to the die orientation of the semiconductor wafer within the range of -15° and -75°.

1 35. A method as recited in claim 25, further comprising: collecting the secondary and back
2 scattered electrons generated when the particle beam traverses across the surface of the
3 semiconductor wafer.